

ABSTRACT

1 An implantable infection shield and system for drug delivery in vascular tissue
2 includes a relatively non-biodegradable porous linked fibrous biomaterial which controls and
3 directs cell growth and angiogenesis from adjacent vascular tissue into the implant.
4 Infection shield embodiments stimulate cell growth and angiogenesis from adjacent vascular
5 tissue which effectively blocks passage of pathogenic microorganisms along percutaneously
6 implanted objects. In embodiments for drug delivery, a reservoir of the same biomaterial
7 may contain either (1) a cell culture system enclosed within a porous sealable interior
8 chamber or (2) a biodegradable matrix in which one or more drugs are dispersed. After
9 implantation of a reservoir of the first embodiment in an organism, cultured cells obtain
10 food and oxygen *via* diffusion in tissue fluid through the porous walls of the interior
11 chamber, while metabolic products, including drugs, diffuse away from the cell culture in an
12 analogous manner. In a reservoir of the second embodiment, a biodegradable matrix
13 substantially fills the pores (voids), and progressive dissolution of the matrix releases one
14 or more drugs into surrounding tissue fluid. Reservoirs of either embodiment comprise a
15 plurality of voids of a predetermined size effective for stimulating angiogenesis from the
16 surrounding vascular tissue into at least a portion of the reservoir. The reservoir thus acts
17 to couple a source of drugs to the circulatory system of the organism.